



# Prevalence of Anaemia in Child Bearing Women: A Challenge

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## ABSTRACT

**Background:** Anaemia is prevalent among population of all strata; whether rich or poor, educational profile high or low, it is prevalent everywhere. Iron deficiency anaemia is a serious public health problem having a significance impact on life of everybody. It affects the physical, mental and psycho-social development of the victim, causing generalized weakness, lethargy, lassitude, with effect on optimal work performance, amount to certain behavioural problems. Status of anaemia in child bearing age has reasonable impact on whole life span and has a reasonable impact on the outcome of pregnancy.

**Objectives:** 1. To assess the prevalence and associated factors of anaemia.

**Materials and Methods:** Across-sectional purposive study was conducted on 436 females of reproductive age group (15 to 49 years), residing in the field practice area of urban health training centre of department of community medicine, Geetanjali medical college and hospital, Udaipur, (Rajasthan). Study period was from May 2015 to April 2016.

**Results:** The prevalence of anaemia among the age group above 18 years was (73.8%), educated (72.4%), nuclear family (73.3%), married (87.1%), and low socio-economic status group V (79.9 %). Among anaemic subjects, (76%) were vegetarian, mean haemoglobin  $10.11 \pm 1.03$  gm %, and (3.2%) were severely anaemic. History of worm infestation having anaemia was (89.2%), and symptoms of easy fatigability among the anaemic were (84.8%)

**Conclusion:** The results of the study simplify the need to concentrate on anaemia prophylaxis measures, already in existence for masses and also for child bearing women. The component of health education including nutrition education also to be strengthened with awareness to the public.

**Key Words:** Haemoglobin, Vegetarian, Worm infestation, Health

## INTRODUCTION

Anaemia is an important public health problem which affects masses, particularly child bearing women. It is estimated that (75%) of the anaemia is due to iron deficiency, followed by folate and Vitamin B12<sup>1</sup>. The adolescent health was given priority by Government of India in RCH package since 1997. The anaemia is one of the major challenges to health sector for quality of day to day life. The prevalence of anaemia is disproportionally high in developing countries, because of lack of education, poverty, inadequate diet, poor health services, and early marriages. Report of WHO 2002 showed anaemia as one among the top 10 risks for infant mortality, maternal mortality, and preterm birth. The facts show that anaemia is one of the most prevalent diseases to combat, for increasing quality and life expectancy. Iron deficiency

affects more people than any other condition. As many as (66-80%) of the world population may be iron deficient, over (30%) of the population are anaemic, mainly due to iron deficiency, frequently exacerbated by malaria and worm infestations<sup>2</sup> in developing countries. According to world health organization, the global prevalence of anaemia is 24.8%, which means about 1.62 billion people world-wide are suffering with anaemia. The highest prevalence is in preschool age children (47.4%), while the lowest prevalence in men is (12.7%). Adolescent phase of life is the right path, due to the ever increasing evidence that control of anaemia in pregnancy is easy to achieve satisfactory if the iron status can be earned during adolescence. Anaemia occurs at all stages of the life cycle, but is more prevalent in pregnant women and young children. Anaemia is the most prevalent haematological disorder in women of reproductive age with increased

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rates of maternal, prenatal mortality, premature delivery, low birth weight, and other adverse outcomes. Moreover it has been shown to affect the cell-mediated immunity, mental development, learning capacity, resistance to infection and work performance.

## OBJECTIVE

1. To assess the prevalence and associated factors of anaemia

## MATERIALS AND METHODS

The present cross sectional study was conducted on females of reproductive age group residing in catchment area of urban field practice, of department of community medicine, Geetanjali Medical College and Hospital, Udaipur. In this community based study the population proportion 33% was used to arrive for the required sample size of 436 females. The 1<sup>st</sup> house was selected randomly by lottery system and thereafter every alternate house was picked up, till the required sample size was covered. The study instrument used was a preformat, pretested semi structured questionnaire. Haemoglobin estimation was done by electric impedance method. The purpose of the study was explained to the study subjects and the written consent was obtained. The study was conducted during May 2015 to April 2016.

## DISCUSSION

### Table 1. The Socio-demographic characteristics

**a) Anaemia and age group:** In our study the prevalence of anaemia above 18 years (late) was (73.8%), and below 18 (early) (71.2%), similar results were observed by Kaur S et al<sup>3</sup>, in late (64%) as compared to early (58%), study by Biradar S S et al<sup>4</sup> in rural area of Belgaum showed higher prevalence in late (60%) as compared to early (38.9%)

**b) Religion:** The prevalence of anaemia in our study, among Hindus was slightly more (82.6%), compared to Muslims (80.8%), whereas Sachan B et al<sup>5</sup> in their study, observed the prevalence (59.2%) in Hindu against (37.5%) Muslims. Similar results, Hindu (53.96%) and Muslims (47.92%), were seen by Bilkish N et al<sup>6</sup> in their study on 416 females in rural area of Maharashtra.

**c) Family composition:** Our study shows the prevalence of anaemia was more (73.3%) in nuclear families, compared to joint families (69.9%). In contrast to our results Rawat CMS et al<sup>7</sup> studied 504 females in rural area of Daurala PHC at Meerut, observed prevalence in joint family was higher (45.2%), than nuclear families (28.3%), Bilkish N et al<sup>6</sup> also observed that the nuclear families were slightly less prevalent (51.79%) than joint families (52.08%)

**d) Education** In present study the prevalence of anaemia was more among educated (72.4%) compared to illiterate (68.2%), this is supported by Bhanushali et al<sup>8</sup> in their study among 387 females that among 104 anaemic females, the (55.8%) were literate. As education increases the prevalence of anaemia decreases, in contrast to our study Kaur S et al<sup>3</sup> observed, high prevalence among illiterate (66.7%), and Bilkish N et al<sup>6</sup> observed (71.32%) in illiterate and only (20.25%) in literate females. **e) Marital status:** Our study shows more prevalence of anaemia among married females (87.1%) compared to unmarried (70.9%). NFHS-3, Rajasthan<sup>9</sup> also shows the prevalence of anaemia more in married (54.3%) compared to unmarried (49.9%).

**f) Socio-economic status:** It is observed that as socio-economic status increases prevalence of anaemia decreases, as in our study it is highest among class V (79.9%) and lowest among class III (67.9%). No female of class I was observed anaemic. Similar results were also observed by Kaur S et al<sup>3</sup> class V (73.4%), class II (54.3%), class I (41.7%). Rawat CMS et al<sup>7</sup>, revealed among class V (50%) and class I (27.3%). Biradar SS et al<sup>4</sup> reported anaemia among females of class III was (4.1%) where as it was (43.1%) in class IV and (100%) in class V. The study by Bilkish N et al<sup>6</sup> observed prevalence of anaemia among class IV and V (61.42%) and class I, II, III (56.62%).

### Table 2 Mean haemoglobin level

In our study the mean haemoglobin of those females who had anaemia was  $10.11 \pm 1.03$  gm% and that of non-anaemic females was  $13.04 \pm 0.77$  gm%. Similar results were observed by Biradar SS et al<sup>4</sup> anaemic girls  $10.9 \pm 1.04$  gm%, and non-anaemic girls were  $12.80 \pm 0.5$  gm%. Sen A et al<sup>10</sup> studied the functional impact of anaemia in 350 young adolescent females from different schools in Vadodara and the mean haemoglobin level of total sample of females was 11.32g/dl; 10.67g/dl for anaemic and 12.68g/dl for non-anaemic.

### Table 3 Severity of anaemia

The present study reveals, (68.5%) females moderately anaemic, (28.3%) mild and (3.2%) severely anaemic. Study conducted by Siddharam S M et al<sup>11</sup> had more prevalence of mild (54.9%), moderate (45.2%), and (4.92%) severe. Sharma et al<sup>12</sup> observed similar results to our study, moderate (72%), mild (16.5%), and severe (11.5%), while the study of Toteja G S et al<sup>13</sup> observed moderate, mild, and severe (50.9%), (29.2%), (7.1%) prevalence of anaemia respectively.

### Table 4 Anaemia and diet

In present study the prevalence of anaemia was more among vegetarian diet females (76%), compared to (63.3%) mixed diet. Bilkish N et al<sup>6</sup> showed prevalence of anaemia among vegetarian (55.08%) v/s (47.78%) among mixed diet, Kakkar R et al<sup>14</sup> studied factors contributing to anaemia in 317 females

in Bhopal, observed prevalence of anaemia was dependent on knowledge, literacy level, food habits, and non-vegetarian diet. Patel S et al<sup>15</sup> in their study on 100 anaemic patients from Shri Krishna Hospital, Karamsad observed prevalence of anaemia among vegetarian was very high (84%), against non-vegetarian (16%).

### Table 5 Anaemia and worm infestation

In this study the prevalence of anaemia was higher (89.2%) among females who gave a history of worm infestation as compared to those who did not give such history of worm infestation (69%). This difference was statistically highly significant. Our study is also supported by study of Goel S et al<sup>16</sup> and Bilkish et al<sup>6</sup> who observed that the females who had history of worm infestation were anaemic v/s non-anaemic (84.6%) v/s (43.8%) and (77.78%) v/s (50.75%) respectively. Ramzi M et al<sup>17</sup> studied 363 school females in Kavar, Southern Iran, observed that only parasite infestation in the last three months had a 6.83 times more risk of anaemia than those without this history.

### Table 6 Anaemia and presentation of symptoms

In our study the prevalence of anaemia was higher (84.8%) among females who had symptoms of easy fatigability as compared to those who did not had such symptoms (60.8%), similarly with symptoms of reduced working capacity (82.4%) v/s (69.3%) with no such symptom, with symptom of palpitation (75.3%) v/s (71.3%) without palpitation. Goel S et al<sup>16</sup> observed the signs and symptoms like headache, fatigue, dyspnoea, paraesthesia and attack of syncope, significantly more prevalent in anaemic subjects.

## CONCLUSION

The study was carried out to understand the current prevalence and associated factors of anaemia among females of child bearing age. To prevent anaemia, public should be made aware through conduction of health and nutrition education campaign, so that the current comprehensive health services may be utilised properly. Our study emphasised for various measures of social and economic development to be initiated for lowering the prevalence of anaemia to improve the quality of life of the females.

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## REFERENCES

1. Alem M, Enawgaw B, Gelaw A, Kena T, Seid M, Olkeba Y. Prevalence of anaemia and associated risk factors among pregnant women attending antenatal care in Azezo health centre Gondar town, Northwest Ethiopia. *J Interdisipl Histopathol*, 2013;1(3):137-144.
2. WHO (2004) Focusing on anaemia : Towards an integrated approach for effective anaemia control, Joint Statement by the World Health Organisation and the United Nations Children's Fund, Geneva, WHO.
3. Kaur S, Deshmukh P R, Garg BS. Epidemiological correlates of nutritional anaemia in adolescent females of rural Wardha. *Indian Journal of Community Medicine* 2006;31(2):255-8.
4. Biradar S S, Biradar S P, Alalagi A C, Wantamutte A S, Malur P R. Prevalence of anaemia among Adolescent girls: A one year Cross-Sectional Study. *Journal of Clinical and diagnostic Research* 2012;6(3):372-7.
5. Sachan, Kishore B. Prevalence of anaemia in adolescent school going girls. *Indian Journal of Community Medicine* 1997;3(1):432-8.
6. Bilkish N Patavegar, MS Kamble, Sanjivani Langare Patil. Prevalence of anaemia and its epidemiological correlates among women of reproductive age in a rural setting. *International Journal of Basic and Applied Medical Science* 2014;4(2):155-9.
7. Rawat CMS, Garg SK, Singh JV, Bhatnagar M, Chopra H, Bajpai SK. Socio-demographic correlates of anaemia among adolescent girls in rural area of district Meerut (UP). *Indian J. Comm. Med* 2001;26:173-5
8. Bhanushali MM, Shirole AR, Joshi YM, Kadam VR. An intervention of iron deficiency anaemia in dietary behaviour among adolescent girls. *International J of Pharmacy and Pharmaceutical Sciences* 2011;3(1):40-2.
9. NFHS-3 India, 2005-2006- National Family Health Survey-3. Anaemia among women and children by International Institute for population Sciences Mumbai.
10. Sen A, Kanani S J. Deleterious functional impact of anaemia on young adolescent school going girls. *Indian journal of Paediatrics*. 2006;43(2):220-6.
11. Siddharam SM, Venketesh GM and Thejeshwari HL (2011). A study of anaemia among adolescent girls in Rural area of Hassan district, Karnataka, South India. *International Journal of Biological and Medical Research* 2 92-4.
12. Sharma M K, Swami H M, Bhatia V, Verma A, Bhatia SPS, Kaur G. An epidemiological study of correlation of osteoarthritis in geriatric population of UT Chandigarh. *Indian Journal of Community Medicine* 2007;32(1):77-8.
13. Toteja G, Singh P. Micronutrient deficiency disorder in 16 districts in India. Report of an ICMR task for study. District Nutrition Project Part I. 2001.
14. Kakkar R, Kakkar M, Kandpal SD. Depth of anaemia in adolescent school girls of Bhopal. *Indian j of Community Health* 2010;22:38-40.
15. Patel S, Shah M, Patel J, Kumar N. Iron deficiency anaemia in moderate to severely anaemic patients. *Gujrat Medical Journal* 2009;64(2) 15-8.

16. Goel S, Gupta BP. Low anaemia prevalence among adolescent of an urban hilly community. Indian Journal of Community Medicine. 2007;32(1):67-8.
17. Ramzi M, Haghpanah S, Malekmakan N. Anaemia and iron deficiency anaemia in adolescent school going girls in Kavar Urban Area, Southern Iran. Iranian Red Crescent Medical Journal 2011;13(2):128-33.

## RESULTS

**Table 1 The socio-demographic data of the study subjects (n=436).**

The prevalence of anaemia among age group above 18 years was more (73.8%), among Hindus (82.6%), more in nuclear families (73.3%), high in educated females (72.4%) and (87.1%) in married subjects. Majority (79.9%) of the anaemic women were in socio-economic class V.

Demographic factors	Anaemic No. %	Non-anaemic No. %	Total No %
<b>Age in years</b>			
Below 18	210(71.2%)	85(28.8%)	295(100%)
Above 18	104(73.8%)	37(26.2%)	141(100%)
Pearson Chi square test	$\chi^2= 0.313$	$p= 0.576$	Non-significant
<b>Religion</b>			
Hindu	176 (82.6%)	37 (17.4%)	213 (100%)
Muslim	160 (80.8%)	38 (19.2%)	198 (100%)
Christian	16 (64.0%)	9 (36.0%)	25 (100%)
Pearson Chi square test	$\chi^2= 4.993$	$p= 0.0823$	Non-significant
<b>Family composition</b>			
Nuclear	200 (73.3%)	73 (26.7%)	273 (100%)
Joint	114(69.9%)	49(30.0%)	163(100%)
Pearson Chi square test	$\chi^2= 0.0461$	$p= 0.455$	Non-significant
<b>Education</b>			
Educated	286 (72.4%)	109 (25.6%)	395 (100%)
Illiterate	28 (68.2%)	13 (31.8%)	41 (100%)
Pearson Chi square test	$\chi^2=0.3117$	$p=0.5766$	Non-significant
<b>Marital status</b>			
Married	27 (87.1)	4 (12.9)	31 (100%)
Unmarried	287 (70.9%)	118 (29.1%)	405 (100%)
Pearson Chi square test	$\chi^2=3.76$	$p=0.052$	Significant
<b>Socio-economic status</b>			
I	Nil	Nil	Nil

II	0	5(100%)	5(100%)
III	57 (67.9%)	27 (32.1%)	84 (100%)
IV	142 (70.0%)	61 (30.0%)	203 (100%)
V	115 (79.9%)	29 (20.1%)	144 (100%)
Pearson Chi square test	$\chi^2= 18.42$	$p= 0.0003$	Significant
Total	314 (72%)	122 (28%)	436 (100%)

**Table 2 Status of mean haemoglobin among the subjects (n=436)**

The overall prevalence of anaemia was 72%. The mean haemoglobin of anaemic females were  $10.11 \pm 1.03$  gm% against the  $13.04 \pm 0.77$  gm% in non- anaemic.

Haemoglobin	Number	Mean haemoglobin (gm %)	Standard deviation
Anaemic	314(72%)	10.11	0.06
Non-anaemic	122(28%)	13.04	0.07

**Table 3 Distribution of females in relation to severity of anaemia (n=314).**

Out of 314 anaemic females, majority (68.5%) were moderately, and only (3.2%) were observed severely anaemic.

Severity of anaemia	Number	Per cent
Mild anaemia (11 to 11.9gm %)	89	28.3
Moderate anaemia (8to10.9 gm %)	215	68.5
Severe anaemia (< 8 gm %)	10	3.2
Total	314	100

**Table 4 Distribution of subjects in relation to anaemia and diet (n=436)**

The prevalence of anaemia was high among females who take up vegetarian diet (76%) as compared to females of mixed or non- vegetarian diet (63.3%).

Diet type	Anaemic	Non-anaemic	Total	p-value
Vegetarian	228(76%)	72(24%)	300(100)	0.128
Mixed	86(63.3%)	60(36.7%)	136(100)	
Total	314 (72%)	122(28%)	436(100%)	

**Table 5 Distribution of subjects in relation to anaemia and history of worm Infestation (n=436)**

The prevalence of anaemia was higher (89.2%) among females who gave a history of worm infestation against (69%) who did not give such history. In this study the prevalence of anaemia was higher (76.2%) among females who did not consume de-worming tablets in past 6 months as compared to females who had taken the tablets (67.6%).



History of worm infestation and deworming		Anaemic	Non-anaemic	Total number (%)	p-value
Worm infestation	Yes	58(89.2%)	7(10.8%)	65(100)	0.001 Significant
	No	256(69%)	115(31%)	371(100)	
TOTAL		314(72%)	122(28%)	436(100)	
De-worming taken	Yes	144(67.6%)	69(32.4%)	213(100)	0.045 Significant
	No	170(76.2%)	53(23.8%)	223(100)	
TOTAL		314(72%)	122(28%)	436(100)	

**Table 6 Distribution of females in relation to anaemia and presentation of symptoms**

The prevalence of anaemia was higher (84.8%) among females who had symptoms of easy fatigability v/s (60.8%) who did not have such symptoms. The prevalence of anaemia was higher among females who presented with symptoms of reduced working capacity (82.4%) v/s who did not had relevant symptoms (69.3%). Similarly, higher prevalence of anaemia was seen with symptoms of palpitations in females (75.3%) v/s that had no palpitations (71.3%).

Symptoms of anaemia		Anaemic	Non- anaemic	Total number (%)	p-value
Easy fatigability	Present	173(84.8%)	31(15.2%)	204(100)	0.001 Significant
	Absent	141(60.8%)	91(39.2%)	232(100)	
	Total	314(72%)	122(28%)	436(100)	
Reduction in working capacity	Present	75(82.4%)	16(17.6%)	91(100)	0.013 Significant
	Absent	239(69.3%)	106(30.7%)	345(100)	
	Total	314(72%)	122(28%)	436(100)	
Palpitations	Present	55(75.3%)	18(24.7%)	73(100)	0.488 Not significant
	Absent	259(71.3%)	104(28.7%)	363(100)	
	Total	314(72%)	122(28%)	436(100)	